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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/775,688	02/02/2001	Albert D. Edgar		3471

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EXAMINER

EDWARDS, PATRICK L

ART UNIT	PAPER NUMBER
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2621

DATE MAILED: 01/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/775,688

Applicant(s)

EDGAR, ALBERT D.

Examiner

Patrick L Edwards

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 February 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 and 5. 6) ☐ Other: .

DETAILED ACTION

Drawings

1. New corrected drawings are required in this application because the drawings are illegible. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 410, 420, 430 (page 8 line 1 in the specification) and 312 (page 8 line 13 in the specification). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 110, 112 (Figure 3) and 806 (Figure 8). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities:
 - a) The blank lines on page 1 lines 5-14 need to be filled in.
 - b) The description of Figure 6 that details the steps of the "guiding" process (pages 9-11) is not clear enough to enable one skilled in the art to fully understand what the method of "guiding" entails.

For example, the term "sequence" in line 25 of page 9 has no antecedent basis.

It is also unclear whether the difference values from the fourth paragraph on page 9 and the first paragraph on page 10 are referring to individual difference values between a center pixel and another pixel, a summation of difference values within a window, or something else entirely.

With respect to the first two paragraphs of page 10, there is ambiguity referring to whether the weighted value is “between one and zero” (pg 9 lines 4 and 9) or “either zero or one”.

In the third and fourth paragraphs on page 10, there are a number of instances when it is unclear whether the term “square” is referring to the center square of a particular window or another square in the window.

Also, it is unclear what the “sheep artifact at the square” is referring to.

The above examples are given to show the types of ambiguities and points of confusion that contribute to the unclear description of the “guiding” process and are not meant as an exhaustive list. Similar ambiguities and points of confusion that exist in the specification but have not been mentioned above, also require correction.

Additional ambiguities and uncertainties prevalent in the specification’s explanation of “guiding” are addressed in paragraph 6 below with respect to claim 5. Since the language used to describe the “guiding” process in the specification is similar to the language used in claim 5, the applicant is encouraged to use the claim 5 arguments in paragraph 6 in addition to the aforementioned points of confusion as an aid in correcting the specification.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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6. Claims 1-11 and 16-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claim 2, the term “differences” lacks antecedent basis. No plural differencing operations were recited in claim 1 or 2.

With regard to claim 5, the term “the square” as stated in line 12 is ambiguous because it is not clear whether it is referring to the centrum square of line 10 or the other square from line 11.

Additionally, the phrase “all of the values for the square” from line 13 has no antecedent basis because no previous mention has been made of a plurality of values of a square. In fact, lines 10-11 indicate that a square consists of a singular value.

Additionally, the term “the square of the window” from line 14 is ambiguous because it isn’t clear whether it is referring to the centrum square from of line 10 or the other square from line 11.

Additionally, the phrase “all of the results” from line 16 has no antecedent basis because no previous mention has been made of a plural multiplication operation. In fact, it appears as if the multiplication operation (from line 14) is singular.

The operation described in lines 18-19 is also indefinite because it is using the results of the previously argued indefinite operations.

Claims 1, 4, 9, 10, 16-20 and 22 refer to the method of “guiding” which is detailed in the specification. Since this description is indefinite (see paragraph 4), it follows that the claims which refer to the “guiding” operation are indefinite as well.

Claims 3, 11, 21 and 23 are rejected as being dependent on indefinite claims.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-3,9,10,12-17 and 22-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Ristau et al. (“Digital Filtering of 2-D Spatial Data using Modified Local Statistics”).

With regard to claim 1, Ristau discloses a method of blurring (performing noise reduction) a digital image. Ristau discloses separating the image into noisy and less noisy artifacts (pg 2 line 4). The variable’s z and x disclosed in Ristau are analogous to noisy and less noisy artifacts, respectively, as recited in the claim. The applicant defines the term “artifact” as a digital data set in lines 9-10 of the specification. For interpretation purposes, this definition is incorporated herein.

Ristau further discloses averaging the less noisy artifact over a spatial range for each pixel of the image (pg 2 lines 8-10) and guiding the noisy artifacts by the less noisy artifacts in the step of averaging (pg 2 line 17). The equation disclosed in pg 2 line 17 shows the noisy artifact as a function of the less noisy artifact. In other words, the noisy artifact is being determined or “guided” by the less noisy artifact.

With regard to claim 2, Ristau discloses determining a difference between a pixel at a centrum of the spatial range and another pixel of the spatial range (pg 2 lines 13-16). Ristau discloses determining the variance under a filter mask. Determining a difference between a pixel at the center of a spatial range and another pixel of the spatial range is inherent in the process of calculating the variance of a spatial range corresponding to a center pixel. Ristau further discloses weighting the noisy artifact based on the differences (pg 2 lines 21-23). Ristau discloses a value k which weights the noisy artifact in line 21. This value is determined based on the difference (variance) as shown on line 23.

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With regard to claim 3, Ristau discloses performing the steps of determining and weighting for each pixel in the image (pg 2 lines 14-15). Ristau further discloses that the weighting correlates the spatial ranges of the less noisy artifact with the ranges of the noisy artifact (pg 2 line 21 eqn 5). The weighted term in this equation is a difference (or correlation) value between pixels of the noisy and less noisy artifacts.

With regard to claim 9, all of the limitations have been addressed with respect to claim 1.

With regard to claim 10, Ristau discloses limiting noise in a low contrast area of an image (pg 2 lines 26-27). An overly expressed property of a noisy artifact is the appearance of the noise in the image. Consequently, limiting the noise of a noisy artifact in a low contrast area of an image prevents the image from appearing noisy and an expression of an overly expressed property of the noisy artifact is suppressed. As a result, the limitations of claim 10 are inherent in Ristau's disclosure.

With regard to claim 12, Ristau discloses weighting a value in a blur region (pg 2 line 21). Please note that the value z which is getting weighted in the equation, is the center pixel of a filter mask. The filter mask disclosed in Ristau is analogous to a blur region as recited in the claim.

Within regard to claim 13, Ristau discloses that the less noisy artifact is used to determine the weighting coefficient k (pg 2 line 23).

With regard to claim 14, Ristau discloses that the step of weighting is affected by an extent of a property of an artifact (pg 2 lines 26-30). Whether or not an artifact is a low or high contrast area is a property of an artifact that affects the step of weighting.

With regard to claim 15, Ristau discloses that weighting is dictated by both noisy and less noisy artifacts. The weighting coefficient is determined based on a less noisy artifact, but the term that gets weighted by the weighting coefficient is a function of the noisy artifact. Consequently, both artifacts dictate the weighting operation.

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With regard to claim 16, all of the limitations of the claim have been addressed with respect to claim 1.

With regard to claim 17, all of the limitations of the claim have been addressed with respect to claim 3.

With regard to claim 22, Ristau discloses a system for blurring (reducing noise) comprising a noisy artifact and a less noisy artifact which have corresponding spatial locations (pg 2 lines 4-5). Ristau further discloses guiding the noisy artifact by the less noisy artifact (pg 2 line 17). Although Ristau doesn't explicitly disclose a computer for performing this operation, a computer has to exist in order for this operation to be performed. Therefore, a computer is inherent in the disclosure.

With regard to claim 23, all of the limitations have been addressed with respect to claim 2 above.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ristau as applied to claim 1 above, and further in view of Cok (USPN 5,264,924). The arguments as to the relevance of Ristau as applied in paragraph 8 above are incorporated herein.

Ristau discloses a noisy artifact and performing steps of guiding and weighting based on the noisy artifact. Ristau fails to expressly disclose that the noisy artifact is a representation artifact, which is derived as the average of noisy artifacts.

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Cok, however, discloses a representation artifact which is derived as the average of the noisy artifacts (Cok col 2 lines 6-11). The luminance sensor output L, which is derived from the r, g and b signals for which reduced noise estimates are desired, gets guided and then weighted in order to produce a noise-reduced (blurred) estimate of the noisy artifacts (Cok col 2 lines 29-36).

It would have been obvious to one reasonably skilled in the art at the time of the invention to combine the derivation of a representation noisy artifact as an average of the noisy artifacts as taught by Cok, with Ristau's method of guiding and weighting a noisy artifact. Such a modification would have allowed for a method that could perform a blurring operation on a plurality of color components with one noisy artifact (Cok col 2 lines 34-36). This would have saved processor time and consequently sped up the blurring process.

11. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ristau as applied to claim 10 above and further in view of Cok (USPN 5,264,924). The arguments as to the relevance of Ristau as applied in paragraph 8 above are incorporated herein.

Ristau discloses limiting an expression of an overly expressed property of a noisy artifact, but fails to expressly disclose that the noisy artifact exhibits a property of the color green.

Cok, however, discloses reducing green measurement noise by 20-30% (Cok col 8 lines 18-20). It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Ristau's step of limiting an expression of an overly expressed property of a noisy artifact by specifying the reduction of the property of the color green as taught by Cok. Such a modification would have allowed for the expression limiting step to be applied to a color which benefits greatly from such an operation.

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12. Claims 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ristau as applied to claim 17 above, and further in view of Gray et al. (USPN 5,641,596). The arguments as to the relevance of Ristau as applied in paragraph 8 above are incorporated herein.

With regard to claim 18, Ristau discloses deriving, guiding and averaging steps with a noisy artifact. Ristau fails to expressly disclose repeating these steps with more than one noisy artifact. Gray, however, discloses performing a smoothing operation on a plurality of noisy artifacts (Gray col 3 lines 9-11).

It would have been obvious to one reasonably skilled in the art at the time of the invention to repeat Ristau's deriving, guiding and averaging steps for a plurality of noisy artifacts as taught by Gray. Such a modification would have allowed for a method that would reduce noise in all of the color channels of an image and would result in better quality image.

With regard to claim 19, Gray further discloses performing a smoothing operation on a plurality of less noisy artifacts (Gray col 2 lines 52-55). The average density and standard deviation values of an image patch as disclosed in Gray is analogous to a less noisy interest as recited in the claim in that these values guide a noisy artifact in the method of blurring.

With regard to claim 20, Gray discloses repeating the claimed steps with more than one noisy filter and more than one less noisy filter.

With regard to claim 21, Gray discloses that the average density and standard deviation values calculated for a given color channel in an image patch (Gray col 2 lines 52-55) correspond to a noisy artifact of the same color channel (Gray col 3 lines 3-22).

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick L Edwards whose telephone number is (703) 305-6301. The examiner can normally be reached on 8:30am - 5:00pm M-F.

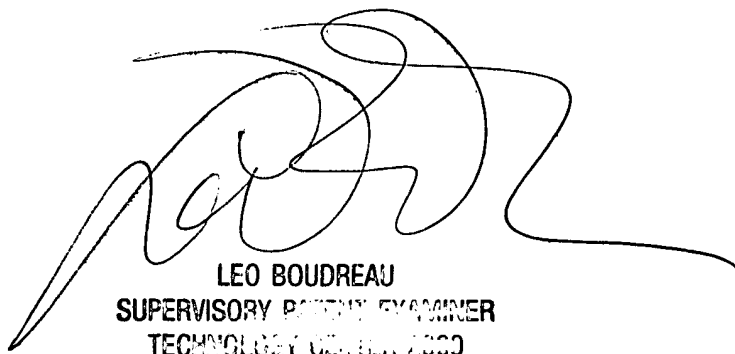
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Patrick Lynn Edwards

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